The Basics of "Too Big to Fail"

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Abstract

This essay lays out the basics of the "too-big-to-fail" (TBTF) phenomenon: What it means; why it is a problem; the central role that TBTF financial institutions played in the financial crisis of 2008; and why better prudential regulation than was present prior to 2008 is needed for the future.

Key words: Too big to fail (TBTF); prudential regulation; capital; leverage; liquidity; runs

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"It's only when the tide goes out that you learn who's been swimming naked."
Warren Buffet

I. Introduction.

The financial crisis of 2008 brought to political and regulatory prominence the concept of financial institutions that are "too big to fail" (TBTF). TBTF financial institutions were at the heart of the crisis. TBTF institutions were the first recipients of "bailouts" from the U.S. Government, through the "troubled asset relief program" (TARP) and through other federal measures, so as to forestall their reneging on their debt obligations (and in that sense failing).[1]

The searing nature of the financial crisis (and the searing nature of "the Great Recession" that followed) plus the unpopularity of the apparent bailouts[2] and the TARP program made financial reform legislation inevitable. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 was that inevitable legislation; and included in that Act were extensive provisions (essentially, Titles I and II of the Act) that were designed to address TBTF issues. The Act used the term "systemically important financial institution" (SIFI) to refer to TBTF institutions.

This essay will attempt to explain the TBTF concept and why it was (and continues potentially to be) a genuine problem for the American financial system and for American financial regulation.

II. What Is TBTF?

[1] As will be clear in the discussion that follows, TBTF is in many ways a misnomer; "too big to be put through a resolution process that would cause creditors and counterparties to not be paid promptly and fully" would be a more accurate description. But the latter phrase cannot be readily captured in a simple anagram and is unlikely to attract journalistic or political/popular attention. Consequently, the remainder of this essay will continue to use the TBTF anagram.

[2] As subsequently became clear, the primary beneficiaries of the "bailouts" were the creditors to the targeted financial institutions.

For our purposes, TBTF starts with a financial institution:[3] a company that primarily holds financial instruments (such as stocks, bonds, loans, derivatives, etc.) as assets on its balance sheet. This category of company includes commercial banks and other depositories; bank holding companies (BHCs); modern investment banks;[4] insurance companies (and their holding companies); pension funds; finance companies; hedge funds; and mutual funds.[5] And, of course, the financial institution has to be relatively large.

Next, the liability side of the TBTF financial institution's balance sheet has comparatively little equity (which, for financial institutions, is the overwhelming component of their "capital") and is thus largely fixed-obligation debt; equivalently, these institutions are thinly capitalized and are thus highly leveraged. This condition eliminates most mutual funds, since the claimants of mutual funds own "shares" that fluctuate in value with the value of the fund's assets and thus do not represent the fixed obligation that is associated with debt.[6]

Next, the assets of the TBTF financial institution tend to be relatively opaque and illiquid, with thin markets.[7] Since the assets are opaque, they are hard for outsiders to value; and since the assets are relatively illiquid, they cannot be sold quickly except through substantial price discounts from whatever quotes existed in their (thin) markets.

Further, the TBTF institution's assets tend to be longer-term than its debt liabilities; in particular, a significant fraction of its debt liabilities are quite short-term. For banks, these are

[3] I will leave to others the determination of whether a large industrial corporation, such as General Motors, should be considered to be TBTF as well.
[4] Until the 1990s, investment banks were primarily financial facilitators, in the sense that they were brokers, dealers, market makers, and advisors but had relatively small balance sheets and thus were not primarily holders of financial assets.
[5] If real estate is included as a "financial asset", then real estate investment trusts (REITs) would also be included as potential TBTF institutions.
[6] Money market mutual funds (MMMFs) are the primary exception, since they customarily maintain their share values at $1.00, and there is a strong presumption on the part of their shareholders that the MMMFs are committed to maintaining that $1.00 value. Indeed, as is discussed below, when one MMMF "broke the buck" in September 2008, this sparked a run on MMMFs more generally.
[7] Again, this eliminates most mutual funds.

generally deposits. For other financial institutions, these short-term liabilities could be commercial paper or repurchase agreements ("repos").

These short-term liabilities mean that the institution is "run-able": the liability holders (creditors) can decide either to withdraw their funds (in the case of bank deposits) or to refuse to roll over their existing (short-term) loans. Runs by bank depositors have been a well-known phenomenon for well over a century; the institution of federal deposit insurance in the U.S. in 1933, however, has made bank runs virtually an historical relic.

By contrast, in 2008 for the first time ever the U.S. financial system saw runs on nine TBTF financial institutions by their short-term creditors (who were not depositors). These nine included five large investment banks, two government-sponsored enterprises (GSEs), a large bank holding company, and a large insurance holding company. These creditors were not covered by deposit insurance and were not wholly confident that the federal government would keep them whole.

Why might a run on a financial institution arise? Due to the limited liability of owner-shareholders of a corporation (including financial institutions), if the company's assets are inadequate to cover the claims of its creditors – if it is insolvent – then the owners are generally not liable for the shortfall.[8] Consequently, if short-term creditors fear that the financial institution is likely to become (if it is not already) insolvent,[9] they will want to "run" to withdraw their deposits (or not roll over their short-term loans) before some form of resolution process – e.g., bankruptcy or receivership – delays their ability to claim their funds and/or requires them to

[8] And even if corporate owners were liable for the insolvent corporation's obligations, the limits of personal bankruptcy could effectively limit their liability.

[9] Recall that the values of the assets are opaque, so the "outside" liability holders are likely to have difficulties in determining those values and thus determining the solvency of the institution.

accept less than "100 cents on the dollar".[10] Further, because these financial institutions' assets are relatively illiquid, even a solvent institution (if it does not have access to a "lender-of-last-resort") may be subject to runs: If some short-term liability holders fear that other short-term liability holders may be worried about the insolvency – or even just the illiquidity – of the institution (and might run), then the initial group would want to run "first", so that the second group's run doesn't interfere with the initial group's ability to claim their funds.[11]

A run reduces value in multiple dimensions: The short-term liability holders incur transactions costs during the run, and they have to find other places/institutions for their funds; the short-term liability holders who are too late lose immediate access to their funds, as well as being exposed to possible losses of initial amounts. Further, the financial institution, in order to try to meet the claims of its "running" creditors, has to liquidate loans and other investments that it had expected to hold for a longer term. If the institution is subsequently liquidated, the brand name and specific human capital that was associated with that organization is likely to be destroyed.

Finally, an insolvency (or a run that could lead to an insolvency) at one institution is likely to have negative consequences for other parties, either through a "cascade" or through "contagion", and thereby lead to more widespread runs. To the extent that other financial institutions are claimants (short-term creditors) on the insolvent institution and have their claims (which they consider as assets) impaired, then the claimants on <u>those</u> financial institutions may have their claims impaired, and a "cascade" may form (and runs may develop in fearful anticipation of the cascade). Alternatively, if short-term (and imperfectly informed) claimants on a financial institution that is roughly similar to the first (troubled) institution see that institution

[10] Again, federal deposit insurance has largely cured this problem for banks.
[11] This creates a "prisoner's dilemma" type of problem.

become insolvent (or see a run develop that could lead to that institution's insolvency), then they may become fearful about their own institution's solvency (or become fearful about other creditors' fears) and thus begin a run on their own institution. This latter phenomenon is usually described as "contagion".

Again, if the relevant financial institutions are large, then the consequences for the financial system and the larger economy of these runs and insolvencies can be substantial. Last-minute decisions by policymakers to try to avoid those consequences – by providing "bailout" financial support to the institutions (or, really, to their creditors) – are understandable in this context. But such last-minute actions also create the "moral hazard" expectations by the institutions' owners and managers, as well as by their creditors, that similar bailouts are likely in the future. Of course, much better would be ex ante prophylactic measures that would lessen the problems and the need for the last-minute decisions.

III. TBTF in Practice: The Crisis of 2008.

A. The data.

Table 1 lists the assets and net worth percentages of the 15 largest financial institutions in the U.S., as of December 31, 2007 – just before the crisis. The net worth percentages are especially relevant since, for a financial institution, its "capital" is essentially its net worth. For comparison purposes, Table 2 lists the assets and net worth percentages of the 15 largest non-financial companies in the U.S., also as of December 31, 2007.

A few comparisons are immediately worth noticing: First, the smallest of the 15 largest financial institutions was substantially – over 40% – larger than the largest of the non-financial companies. Second, none of the financial companies had net worth ratios above 10%, while

(with the exception of the two struggling auto companies) none of the non-financial companies had net worth ratios that were below 20%. Especially noteworthy are the net worth ratios of the five large investment banks in Table 1: None of them exceeded 4%!

There are a few things that are not fully conveyed by Table 1: First, Citigroup is best understood as a (roughly) $1.2 trillion depository institution, on top of which was a (roughly) $1 trillion holding company (including its non-depository subsidiaries). The holding company's net worth was smaller than the depository's net worth;[12] in essence, if the net worth of the depository (i.e., the capital of the depository, which also counted as an asset for the holding company) was ignored, the holding company was insolvent.[13] The liabilities of the holding company were not deposits and thus were not covered by deposit insurance; the holding company had access to the Federal Reserve (as a lender of last resort) only through its depository subsidiary; and, although the Citi holding company was prudentially regulated (albeit, poorly) by the Federal Reserve, there was no resolution process except for bankruptcy in the event that the Citi holding company was found to be unable to satisfy the claims of its creditors.

Second, the assets and net worth data for the American International Group (AIG) neglect the fact that AIG's holding company had a Financial Products subsidiary that, primarily from its London office, had engaged in major financial activities. These included large investments in residential mortgage-backed securities (MBS), derivatives trading, and the selling of hundreds of billions of dollars of credit default swaps (CDS), much of it on residential MBS. CDS are essentially insurance contracts that protect the CDS purchaser against default (i.e., non-repayment) by the borrower of the underlying bonds. However, the Financial Products unit had not maintained sufficient capital against the possibility that its investments might yield losses;

[12] The depository's net worth was $143.6 billion; the holding company's net worth was only $113.6 billion

[13] This is especially ironic since the Federal Reserve, which prudentially regulates BHCs, has for many decades maintained that holding companies are supposed to be a "source of strength" for their depository subsidiaries.

had not set aside sufficient reserves against the possibility that the bonds underlying its CDS sales would default and that AIG would consequently have to make payouts on the contracts; and had not set aside sufficient collateral that would be required by its CDS counterparties if the underlying bonds fell in value (but had not yet defaulted).

Third, the data for Fannie Mae and Freddie Mac (the GSEs) neglect the fact that together they had also issued approximately $3.5 trillion in MBS that carried their guarantees, which protected the MBS investors against defaults by the underlying mortgage borrowers. Since net worth is the buffer that protects a company's debt claimants against losses, the effective net worth ratios (as a protection against the losses that could arise from losses in the value of assets or losses on MBS) were only a third of the levels shown for the two companies.

Fourth, the data in Table 1 don't indicate that all of the financial institutions – to greater or lesser extents – had invested in residential MBS and thus were potentially exposed to losses on those MBS.

Fifth, the data in Table 1 don't indicate that, with the exceptions of MetLife and Prudential, all of the financial institutions in the table relied significantly on short-term funding and thus were potentially run-able (although the commercial banks had the protection of deposit insurance).

B. The crisis.

The story of the financial crisis of 2008 is essentially the story of nine of the 15 financial institutions in Table 1: the five large investment banks (Goldman Sachs; Morgan Stanley; Merrill Lynch; Lehman Brothers; and Bear Stearns); the two GSEs (Fannie Mae and Freddie Mac); the ($1 billion in assets) Citi holding company; and the AIG holding company. The nine financial institutions shared a number of crucial characteristics: They were large; they were

interconnected with each other and with other financial institutions as lenders/borrowers and as counterparties in various types of financial transactions; they were thinly capitalized; they were subject to weak prudential regulation; they relied to a significant extent on short-term funding, so that they were potentially exposed to creditor runs; none of them had deposit insurance or direct access to the Federal Reserve in its role as lender-of-last-resort; and, except for the GSEs, bankruptcy was the only means by which severe financial difficulties could be resolved.[14]

As background to the crisis, it is important to recall that from the late 1990s through the middle of 2006 the U.S. experienced a major housing boom – which is now recognized to have been a bubble. Between 1997 and 2006 the S&P/Case-Shiller Index of home prices rose by approximately 125%, whereas the U.S. Consumer Price Index rose by only 28%. National housing prices peaked in mid-2006 (as measured by the Case-Shiller Index) and subsequently declined by about 35% over the next six years. During the approximately eight years of extraordinary increases in housing prices, a mentality that "housing prices will always increase" seemed to envelop most of the individuals in and around the housing and housing finance sectors.

Among the consequences of this mentality was a substantial loosening of mortgage underwriting and lending standards. After all, if housing prices would always increase, then the standard indicia of creditworthiness – Did the borrower have a good "track record" in handling credit obligations in the past? Could the borrower afford a 20% down payment? Did the borrower have sufficient income to afford the monthly payments? Were monthly payments even important? – would be irrelevant. Even if the borrower could not directly make the required payments on a mortgage loan, he/she could always sell the house at a profit (since housing prices

[14] For the GSEs, bankruptcy was not an option, since their charters had been created through Congressional legislation, and it appeared that they could be resolved only by subsequent Congressional action. There was some question as to whether the two GSEs could be placed into a conservatorship by their prudential regulator, the Office of Federal Housing Enterprise Oversight (OFHEO); but it was clear that OFHEO did not have the power to place the GSEs into a receivership.

would always increase) and thereby pay off the mortgage – or the lender could declare a default, foreclose and take title to the house, and sell it for more than the value of the mortgage.

Further, after tentative starts in the 1980s and 1990s, "private label" securitization of residential mortgages – i.e., securitization that wasn't being done by the GSEs or by Ginnie Mae[15] – finally found traction by settling on a senior/junior "tranching" structure for residential MBS that appeared to provide sufficient security to the investors in the senior tranches. Since the mentality of "housing prices will always increase" had spread to residential mortgage securitization, the participants in that process – the mortgage originators; the securitizers; the credit rating agencies (which rated the tranches); and the MBS investors – seemed not to notice or care that mortgage underwriting standards had deteriorated. After all, if mortgages would not be a problem, then the MBS that were formed from those mortgages also wouldn't be a problem!

After housing prices peaked in mid-2006 and began to decline, mortgage defaults began to rise. By the summer of 2007 it was clear that many residential MBS issuances were experiencing financial difficulties (because of the defaults by the underlying mortgage borrowers), and the three major credit rating agencies began massive downgrades of (their initially over-optimistic) ratings on hundreds of billions of residential MBS. The market values of the relevant MBS were already falling; the rating downgrades reinforced the process. By the fall of 2007 the financial markets were clearly worried about the consequences of the falling values of MBS for the solvency of many of the TBTF financial institutions that are listed in Table 1.

In the early months of 2008, Bear Stearns began experiencing difficulties in refinancing its short-term borrowings, as its creditors' worries about its solvency deepened. In March 2008

[15] Ginnie Mae is a federal agency that is lodged within the U.S. Department of Housing and Urban Development (HUD) and that securitizes residential mortgages that have been guaranteed by the Federal Housing Administration (FHA), the U.S. Department of Veterans Affairs (VA), or the U.S. Department of Agriculture (USDA).

Bear Stearns' refinancing difficulties became severe; in essence, it was experiencing a run by its creditors. The Federal Reserve concluded that Bear Stearns was too large (with almost $400 billion in assets) and too interconnected to be allowed to enter into bankruptcy and thereby force its creditors to accept delayed and reduced payments (which might then create both a cascade and a contagion). Instead, the Federal Reserve engineered the absorption of Bear Stearns into JPMorgan Chase by providing guarantees to the latter firm against losses that might be experienced on the assets of the former.[16]

During the summer of 2008 it was clear that housing prices were continuing to fall and that mortgage delinquency/default problems were continuing to rise, with concomitant consequences for residential MBS. Fannie Mae and Freddie Mac had experienced operating losses in 2007. (For Freddie Mac this was its first annual loss ever; for Fannie Mae this was its first annual loss since the early 1980s.) Losses for both GSEs continued in the first half of 2008, and by the summer their creditors were becoming nervous that the two might become insolvent. The capital markets had always assumed that, because of the GSEs' special ties to the federal government, in the event of financial difficulties the two GSEs would be backed by the U.S. Treasury and their creditors would be kept whole; but this was only an implicit guarantee, and the Treasury had always declined the opportunity to make it explicit.

In August 2008 the GSEs' refinancing difficulties became severe, as their short-term creditors became increasingly worried that the Treasury might not support the GSEs after all. Again, in essence, this was a run by their short-term creditors. In early September it was clear that the GSEs had become insolvent and that their financing problems had become too great. On

[16] Also, after the Bear Stearns transaction, the Federal Reserve greatly eased the ability of primary dealers in U.S. Treasury obligations (which included the remaining four large investment banks and the Citi holding company, but not the AIG holding company) to access the Federal Reserve as lender-of-last-resort.

September 6 their prudential regulator – the Federal Housing Finance Agency (FHFA)[17] – placed both of them into conservatorships, and the Treasury announced that it would take a 79.9% ownership position and provide the necessary funds to prevent the GSEs from becoming insolvent and thereby honor all of the GSEs' debt obligations. The Treasury had decided that the two GSEs were too big (with over $1.6 trillion in combined assets, and another $3.5 trillion in outstanding guaranteed MBS), with their debt and MBS too widely held, to allow their creditors to experience delayed and reduced repayments – especially at a time that the capital markets generally were nervous about the continuing consequences of residential mortgage and MBS defaults. In the end, the capital market's original belief that the Treasury would likely support the GSEs' creditors proved to be correct.

At the same time that the capital markets were growing nervous with respect to the GSEs' financial difficulties, they were also growing nervous with respect to the solvency of Lehman Brothers and with respect to the ability of AIG to honor its CDS commitments, including the posting of adequate collateral against the declining value of the underlying MBS. Lehman experienced difficulties in rolling over its short-term debt obligations in late August and early September 2008. The Treasury and the Federal Reserve announced loudly that they would not/could not rescue Lehman or AIG or aid in the absorption of either company by some other financial institution. After a weekend of frenzied efforts by the senior management of Lehman to find an acquirer, Lehman (with almost $700 billion in assets) declared bankruptcy on Monday

[17] The Housing and Economic Recovery Act of 2008, enacted in July, eliminated the GSEs' former prudential regulator (OFHEO) and replaced it with a new prudential regulator (FHFA) and provided the latter with stronger prudential regulatory powers, including the power to declare a receivership. However, for strategic reasons (including the ability to keep the GSEs' $1.5 trillion in straight debt and $3.5 trillion in MBS guarantees off the federal government's books), the Treasury and FHFA decided to put the GSEs into conservatorships in early September 2008.

September 15, 2008. The bankruptcy filing meant that all of Lehman's unsecured debt obligations were frozen, so as to be subsequently sorted out by a bankruptcy judge.

During the summer the capital markets had also become nervous with respect to Merrill Lynch's solvency. During the same weekend when Lehman sought but failed to find an acquisition partner, Merrill succeeded (with encouragement from the Federal Reserve and the Treasury) in getting Bank of America to agree to acquire it, thus taking Merrill out of financial danger (although the transaction did not actually close until early 2009).

In the few days immediately after Lehman's bankruptcy filing, the credit markets froze, as institutional lenders became extremely nervous about the safety of lending to any other institution. By Tuesday afternoon, the Treasury and the Federal Reserve changed course and announced that they would support AIG after all. On the same day, a large money market mutual fund (MMMF) – the Reserve Fund – declared that its holdings of short-term Lehman debt were large enough and that the expected value of what it would receive from the bankruptcy resolution was sufficiently uncertain that it would have to "break the buck": It could no longer honor its obligation to redeem its shares at the traditional $1.00 value that was the standard among MMMFs. Although the reduction in share value was relatively small (to $0.97), the shock was large: There was immediately a shareholders' run on a number of other large MMMFs, which was halted only when the Treasury announced at the end of the week a short-run plan for guaranteeing MMMF share values at $1.00.

Although Goldman Sachs and Morgan Stanley were not seen as financially endangered as the other three large investment banks, they were nevertheless not immune to the events of the week of September 15, and they started experiencing their own difficulties in rolling over their short-term debt obligations. During the following weekend, both declared their intentions to

become BHCs – primarily so that they could reassure nervous creditors that their investment banks were now under the prudential regulatory authority of the Federal Reserve (and would, presumably, not be allowed to fail).[18]

Before the end of the week of September 15, the Chairman of the Federal Reserve (Ben Bernanke) and the Secretary of the Treasury (Henry Paulson) agreed that they needed to seek Congressional legislation that would appropriate funds to provide the financial support that the financial sector clearly required. That legislation, the Emergency Economic Stabilization Act of 2008, was passed (after one false start) on October 3 and was signed by President George W. Bush the same day. The legislation authorized the TARP expenditures. Although the original vision of the TARP was to purchase troubled mortgage securities from the major banks, it quickly morphed into a program whereby the Treasury would invest funds in banks and receive preferred stock in return. The first such investments were made dramatically in nine of the largest TBTF financial institutions in the U.S.[19] Their CEOs were summarily called into Secretary Paulson's office on Monday October 13 and told that they must accept TARP funds regardless of whether they felt that they needed the funds. All nine acceded.

In sum, TBTF became a reality for the U.S. financial system in 2008, as manifested by: the Federal Reserve's assistance to JPMorgan Chase in March to help it absorb Bear Stearns; the Treasury's support for all of the debt obligations of the two GSEs in early September; the

[18] There was a deep irony in their seeking to become BHCs: Although the Gramm-Leach-Bliley Act of 1999 had erased many of the boundaries between investment banking and commercial banking, the large investment banks had (prior to September 2008) steadfastly resisted becoming BHCs – because they were fearful that the Federal Reserve's prudential regulatory oversight would inhibit their activities. The events of September 2008 clearly reversed their thinking.

[19] They were Citigroup; Bank of America; JPMorgan Chase; Goldman Sachs; Morgan Stanley; Merrill Lynch; Wells Fargo; Bank of New York Mellon; and State Street Bank. Of the 15 financial institutions that are listed in Table 1 and that were not in this list of the top nine, AIG was already being helped by the Federal Reserve (although it would subsequently need TARP funds as well); the two GSEs were in conservatorships and receiving Treasury infusions; Wachovia had been acquired by Wells Fargo in early October; Lehman had declared bankruptcy; the two insurance companies were not considered in any serious short-run financial difficulties and had few short-term liabilities that would have made them run-able; and Bear Stearns had already been absorbed by JPMorgan Chase.

widespread realization of the traumatic effects that Lehman's bankruptcy had on the financial markets in mid-September; the Federal Reserve's decision to support AIG within a day after the Lehman bankruptcy; the Federal Reserve's decision to welcome Goldman Sachs and Morgan Stanley as BHCs a few days later (as well as its earlier encouragement of Merrill Lynch's absorption by Bank of America); and the Treasury's decision in mid October to spend the first TARP funds on nine of the largest financial institutions in the U.S.

IV. Appropriate Policies for Dealing with TBTF Financial Institutions.

Given the severity of the financial crisis of 2008 and the central role played by TBTF financial institutions, improved policies to address TBTF issues were clearly warranted. The Dodd-Frank Act tried to provide these policies.

To understand the logic of policies that would address the TBTF problem, it is useful to start with the system of prudential regulation that applies to commercial banks (and other depository institutions).

A. The prudential regulation of commercial banks.

At the beginning, it is worth recalling why prudential regulation of commercial banks is important: Essentially, because a large fraction of a bank's liabilities are short-term deposits, banks are run-able. Further, bank assets tend to be illiquid and opaque (and most depositors would be unlikely to have the financial sophistication to be able to assess the solvency of their bank). And the run-ability of banks, combined with the poor/imperfect information by depositors about their own bank's solvency, make banks potentially prone to contagion and/or cascades.[20]

[20] Prudential regulation in the U.S. also applies to insurance companies (the regulators are the 50 states) and corporate defined-benefit pension funds (the regulator is the federal Pension Benefit Guarantee Corporation).

Prudential regulation is best considered as regulators' efforts to keep a financial institution solvent: so that the value of the institution's assets exceeds the value of its debt liabilities.[21] The debt liability holders (for banks: primarily depositors) will thereby remain whole and (in principle) should not feel the need to run on their institution.

At the center of any bank prudential regulatory arrangement is a minimum capital requirement that is commensurate with the risks that are undertaken by the bank.[22] Capital acts as a risk-absorbing buffer to protect the liability holders directly against losses in the value of the bank's assets; capital also serves a discouragement to risk-taking on the part of the bank's owners, since they have more to lose. Since capital is primarily calculated as the net of the simple subtraction of the value of the debt liabilities from the value of the assets, it is essential that the assets (and any "off-balance-sheet" obligations) be valued on a market-value basis (although too often this is not the case).[23] Although net worth is (and should be) the primary component of capital, the inclusion of a component of long-term bail-in-able debt – whether it is described as subordinated debt or contingent capital or some other label – can also be useful: It may provide an additional market signal that can be useful to help the regulators monitor the activities of the bank, and it may also bring into the picture a set of knowledgeable stakeholders whose interests are closely aligned with those of the regulator. And the regulator must have the

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Although run-ability is less of a problem for either kind of institution, the limited ability of beneficiaries to protect themselves provides a reasonable justification for the prudential regulation of these categories of financial institution.

[21] In an important sense, prudential regulation can be considered the public-sector counterpart to the covenants that banks (as lenders to companies) routinely include in their lending agreements and that are routinely included in bond indentures. The public sector is needed because the liability holders of the regulated financial institution are generally not in a good position to protect their own interests.

[22] Recall that for a financial institution, capital is essentially net worth. Risks should be evaluated in a portfolio context.

[23] Where markets are thin, some combination of market information and modeling may be necessary.

power of "prompt corrective action": As a bank's capital level becomes thinner, the regulator must tighten its restrictions on the bank's activities, so as to tighten restrictions on risk-taking.[24]

Next, prudential regulation must involve restrictions of the activities of the bank: The bank must be limited to activities that the regulator can understand well enough so that an appropriate capital requirement can be set and so that the regulator can monitor the activity and judge whether it is being well managed by the bank. If an activity isn't understood sufficiently by the regulator so that the regulator can set an appropriate capital requirement and make judgments as to how well the activity is being managed, how can this activity be appropriate for a bank?

Third, there must be competency and character requirements for the bank's senior management. At the limit, bumblers and felons ought not to be allowed to operate prudentially regulated banks.

Fourth, the financial flows between the bank and its owners (and the friends and associates of its owners, etc.) must be tightly monitored, because it is too easy to drain a bank (through favorable loans or other concessional transactions) so as to benefit the owners at the expense of the depositors. All such transactions must be on "arm's-length" terms.

Fifth, there must be adequate numbers of well-trained and well-paid examiners and supervisors to administer and enforce the regulation.

Sixth, the prudential regulator must have the power of receivership (with clearly specified rules for that receivership), so as to be able to conduct a prompt and orderly disposal of the bank's assets and liabilities in the event of an insolvency. As the Lehman bankruptcy made clear, a bankruptcy process for a financial institution – especially, a large financial institution – creates far too much delay and uncertainty. Further, in the receivership process, there should be a strong

[24] Again, such provisions are standard in the covenants in bank lending agreements and in bond indentures.

presumption that the previous owners and senior management are removed and have no remaining stake in the bank, since it is they who ran it into the ground.

Seventh, there needs to be a liquidity requirement, so as to allow the bank to satisfy unexpected depositor withdrawals. It would seem that banks' access to the central bank, as the lender-of-last-resort, would obviate the need for a direct liquidity requirement. However, since the lender-of-last-resort will want appropriate collateral, which usually means liquid assets, a liquidity requirement is still needed.

Finally, deposit insurance is a useful (and, now, near-universal) supplement to prudential regulation, as a backstop against runs (and the contagion and cascades that might further develop) in the event that prudential regulation fails to achieve its goal of keeping a bank solvent.[25,26]

B. The lessons for dealing with TBTF financial institutions.

Since it is the failure – or fears of failure and the consequent short-term creditor runs – of TBTF financial institutions that is the central problem, a prudential regulatory regime is necessary. The Dodd-Frank Act designates the Federal Reserve as the prudential regulator for TBTF institutions that are not otherwise covered by a robust prudential regulatory regime. Since banks, BHCs, and insurance companies are already covered by prudential regulation, the candidate institutions would seem to be large finance companies (such as GE Capital), any new large investment banks (there currently are none, since the remaining four large investment

[25] Once deposit insurance is in place, prudential regulation can be also interpreted as the analogy to the set of rules that any insurer puts in place vis-à-vis its insureds so as to protect itself against the moral hazard and adverse selection problems that generally accompany the provision of insurance. For example, in this context, the minimum capital requirement can be seen to be analogous to a deductible in a property/casualty insurance policy.

[26] As was noted above, there are parallels between the prudential regulation of banks and of insurance companies and corporate defined-benefit pension funds. Deposit insurance extends the similarities, since all of the states maintain guarantee funds that make good on some or all of an insured's claim in the event that an insurance company cannot satisfy all claims, and the PBGC has a guarantee fund that makes good on some or all of a pensioner's claim if the original pension fund's assets are inadequate.

banks are now each a part of four separate BHCs that are regulated by the Federal Reserve), large hedge funds, large insurance holding companies (such as AIG), and large securities clearing organizations.

As is true for bank regulation, minimum capital requirements that are commensurate with the risks of the TBTF institution must be at the heart of the prudential regulation of TBTF institutions. Again, market-value accounting of the institutions assets and off-balance-sheet obligations is essential, and so is a regime of prompt corrective action.

Similarly, there have to be activities limitations, since only activities that the regulator can understand well enough to be able set capital requirements and to be able to assess competent management should be allowed within the prudentially regulated institution. Also, financial transactions between the institution and its owners must be tightly monitored, for (again like banks) it is too easy to drain the institution so as to favor its owners at the expense of the institution's debt claimants.

Since the TBTF financial institutions typically do not have access to the Federal Reserve as the lender-of-last-resort, adequate liquidity requirements are especially important. Further, since the creditors to the TBTF institutions are not covered by deposit insurance (or its equivalent), some other back-up mechanism is necessary to forestall short-term creditor and counterparty runs in the event that prudential regulation fails and the TBTF institution becomes (or is feared to become) insolvent. Here, the role of <u>additional</u> bail-in-able (i.e., loss-absorbing) long-term debt is crucial. It is often the case that the valuations of troubled financial institutions' assets are sufficiently murky that the institution can claim that it is still solvent (i.e., has positive net worth), while closer examination indicates insolvency. It is this murkiness that causes otherwise unprotected short-term creditors to be nervous and to start to run. To the extent that

the institution also has a substantial amount of bail-in-able debt, this creates an extra margin of reassurance for those short-term creditors and should lessen the chances of runs.

Finally, as is true for banks, the prudential regulator – or its designee – needs to have the power of receivership to deal with insolvent TBTF financial institutions. Again, as the Lehman bankruptcy demonstrated, bankruptcy is not a good resolution process for insolvent TBTF financial institutions. Dodd-Frank designates the Federal Deposit Insurance Corporation (FDIC), which is the receiver for insolvent banks, to be the receiver for TBTF financial institutions, using the phrase "orderly liquidation authority" (OLA).[27] The FDIC appears to understand that resolving an insolvent TBTF institution would be substantially more complicated than the resolution of the typical small insolvent bank with which the FDIC periodically has to deal. Among other things, a TBTF institution is likely to have a much more complicated corporate structure, with multiple subsidiaries that have multiple financing sources. Further, many TBTF institutions may have extensive foreign operations, which will require coordination with the relevant prudential regulators overseas.

How well all of this will work in the event of a new crisis – whether the provisions of the Dodd-Frank Act will function well enough so that the large financial institutions in the U.S. economy are no longer TBTF – remains unknown. To the extent that we have not (yet?) had a new crisis, this is good news; to the extent that nevertheless we don't know how well it will work, this is not-so-good news.[28]

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[27] Although BHCs have been and continue to be prudentially regulated by the Federal Reserve, prior to the passage of the Dodd-Frank Act they could be resolved only through a bankruptcy process. The designation of the FDIC as the receiver for TBTF institutions should make the resolution of a large BHC more feasible.

[28] This essay has not addressed the issue of whether TBTF financial institutions should simply be broken into smaller institutions, as the way to deal with the TBTF problem. Although that is a topic for a wholly different essay, there is one important point that can be made here: To the extent that size itself is seen (*ceteris paribus*) as the problem, then it is a negative externality problem; and as economists have known since at least the 1920s, the best way to deal with a negative externality problem is to put an appropriately structured tax on the negative externality. In the present case, this would mean a tax (or, in the current tax-phobic milieu of Washington, a more appropriate

V. Conclusion.

The problem of TBTF financial institutions is real. Nine large TBTF financial institutions were at the center of the financial crisis of 2008.

This essay has laid out the basics of the TBTF phenomenon: what it means; why it is a problem; how the TBTF problems played out in the crisis of 2008; and why better prudential regulation of TBTF financial institutions than existed prior to 2008 is essential for the future.

Much has been learned since 2008, and some of that learning has been embodied in the Dodd-Frank Act. Whether enough has been learned – and will be remembered! – may be difficult to determine. If the U.S. never experiences another financial crisis that is comparable to the 2008 crisis, perhaps this will be an indication that the lessons have been learned and retained. Or, if the beginnings of a crisis develop but then are forestalled, without the last-minute maneuverings of 2008, perhaps that will be the appropriate indication. The alternative – that policymakers could forget the lessons and that the U.S. could experience another crisis of the magnitude of 2008 – is one that is not pleasant to contemplate.

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word may be "fee") on size; and then the TBTF institutions themselves could decide whether their large size provides sufficient efficiencies that the maintenance of that size (while paying the tax/fee to society to compensate for the negative externalities) is worthwhile, or whether instead reducing their size would make sense for them and, if so, what the least costly way of achieving those size reductions would be.

Table 1: The Fifteen Largest Financial Institutions in the U.S.
(by asset size, December 31, 2007)

Rank	Financial institution	Category	Assets ($ billion)	Equity as a % of assets
1	Citigroup	Commercial bank	$2,182	5.2%
2	Bank of America	Commercial bank	1,716	8.6
3	JPMorgan Chase	Commercial bank	1,562	7.9
4	Goldman Sachs	Investment bank	1,120	3.8
5	American International Group	Insurance conglomerate	1,061	9.0
6	Morgan Stanley	Investment bank	1,045	3.0
7	Merrill Lynch	Investment bank	1,020	3.1
8	Fannie Mae	GSE	883	5.0
9	Freddie Mac	GSE	794	3.4
10	Wachovia	Commercial bank	783	9.8
11	Lehman Brothers	Investment bank	691	3.3
12	Wells Fargo	Commercial bank	575	8.3
13	MetLife	Insurance	559	6.3
14	Prudential	Insurance	486	4.8
15	Bear Stearns	Investment bank	395	3.0

Note: The Federal Home Loan Bank System ($1,272 billion) and TIAA-CREF ($420 billion) have been excluded from this list; if GE Capital were a standalone finance company, its asset size ($650 billion) would place it at #12.

Source: Fortune 500, May 5, 2008.

Table 2: The Fifteen Largest Non-Financial Companies in the U.S.
(by asset size, December 31, 2007)

Rank	Company	Assets ($ billion)	Equity as a % of assets
1	Ford	$279.3	2.0%
2	AT&T	275.6	41.9
3	Exxon Mobil	242.1	50.3
4	Verizon	187.0	27.1
5	ConocoPhillips	177.8	50.1
6	Wal-Mart	163.5	39.5
7	General Motors	148.9	-24.9
8	Chevron	148.8	51.8
9	Proctor & Gamble	138.0	48.4
10	Time Warner	133.8	43.7
11	International Business Machines (IBM)	120.4	23.6
12	Pfizer	115.3	56.4
13	Comcast	113.4	36.4
14	Hewlett-Packard	88.7	43.4
15	Johnson & Johnson	81.0	53.5

Note: Without Ford Credit, Ford would have $118 billion in assets, which would place it at #11. General Electric has been excluded from this list; without GE Capital, General Electric would have $145 billion in assets, which would place it at #9.

Source: Fortune 500, May 5, 2008.